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Occupational rewards relate to sickness absence frequency but not duration

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Abstract. Work stress is an important problem that shifted sickness absence research to the psychosocial work environment at the expense of physical or chemical hazards. Most studies investigated the psychosocial work environment using the Demand-Control model. However, this model does not consider coping styles which are important in absenteeism. The Effort-Reward Imbalance model takes coping into account. Little is known about occupational rewards and their relationship with sickness absence. This study investigated the relations between occupational rewards and the frequency and duration of sickness absence among 366 workers.
The data of 326 employees (89%) were suitable for statistical analysis. Rewards in terms of job esteem (OR = 0.64; 95% CI = 0.47–0.87) and job perspectives (OR = 0.59; 95% CI = 0.57–0.84) were negatively related to the absence frequency in men. Satisfaction with income (OR = 0.53; 95% CI = 0.35–0.81) was negatively related to the absence frequency in women. Occupational rewards were not associated with the mean duration of absence episodes. The associations we found warrant more attention for occupational rewards in sickness absence research.

Keywords: Job demands, occupational rewards, sickness absence frequency, sickness absence duration

1. Introduction

Sickness absence is a major public health problem that has important economic impact because of high insurance costs and lost productivity. Collectively, absence rates depend on social policies particularly sick-leave benefits [24] and economic market characteristics [8,33]. On the company level, workplace organization [9,31], work environment [14,29] and the organizational culture [28,30] are important. On the individual level, sickness absence is determined by personality [16], health [10,25,26], family circumstances [3, 18] and socio-cultural characteristics [32].

A strong body of evidence indicates that exposure to adverse psychosocial work conditions is a major health hazard for workers in modern societies. Much of this evidence is based on the Demand-Control model in which conditions characterized by sustained high demands and low control have been associated with cardiovascular disease [13,15,17] and higher rates of sickness absence [2,5,11,19,20]. A major limitation of the Demand-Control model is that it does not consider coping styles. Workers will respond differently to work conditions leading to varied health outcomes. Coping strategies must be included when studying sickness absence, because absenteeism itself can be regarded as coping behaviour [12].

In the early 1990s, the Effort-Reward Imbalance model was developed [27], which takes coping styles into account. Middle managers with an active coping were found to be at risk of hypertension when suffering from high efforts and low rewards, whereas middle managers characterized by passive coping were more likely to take sick leave in these circumstances [23].

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Peter and Siegrist investigated the effects of extrinsic efforts (i.e. job demands), intrinsic efforts (i.e. the motivations of an individual worker in demanding situations), status incongruence (defined as an imbalance between efforts and aspirations on the one hand, and career achievements on the other), status discrepancy (defined as a mismatch between education and job position), and forced job change on either short-term or long-term absence as well as frequent ($\geqslant 2$) absences [23]. However, it would be interesting to know if and how occupational rewards, in terms of satisfaction with income, job esteem and job perspectives, are associated with sickness absence. Therefore, this study investigated the relationship between occupational rewards and both the frequency and duration of sickness absence.

2. Methods

We investigated the results of health checks which were performed by our regional occupational health department in 2005 in three companies in the Dutch province Friesland: an industry producing crash barriers ($n = 136$), an administrative office ($n = 120$) and a library ($n = 110$). The companies were not downsizing or merging in the period of study. Economy and labour market conditions were stable and social policies did not change during the study period. According to the Medical Ethics Committee of the University Medical Center Groningen, ethical approval was not required because data files were surveyed in retrospect and the results were reported on group level, for which the workers gave informed consent.

Workers who participated in the health checks, completed the Basic Occupational Health Questionnaire [34]. This self-report questionnaire is composed of 110 dichotomous (yes/no) questions about health complaints (40 items), lifestyle (7 items), physical and psychological job demands (14 items), work conditions (18 items), organizational climate (11 items), interpersonal workplace relationships (8 items), and fringe benefits (12 items); additionally the questionnaire has 6 open questions on chronic disease, work-related complaints, and suggestions for improvement of the work environment.

For this study, we used the subscales physical job demands (8 items, Cronbach's alpha $\alpha = 0.60$), psychological job demands (6 items; $\alpha = 0.64$), job control (3 items; $\alpha = 0.53$) and job support (8 items; $\alpha = 0.70$) of the Basic Occupational Health Questionnaire. These data were recorded in occupational health data files and were retrieved for this study.

Occupational rewards are supposed to be distributed by three transmitter systems: money (income), esteem, and status control [23]. We used the result on the question "Is your income in agreement with the work you are getting through?" as a measure for satisfaction with income. This question could be answered with yes or no. Job esteem was obtained accordingly using the item "Do you feel appreciated for the work you are doing?". Low status control is experienced in terms of low job stability, forced occupational change, or lack of promotion prospects [23]. From the data files of 140 participants (69 men and 71 women), we could retrieve items that approximated status control. Four dichotomous items about job stability (2 items), promotion perspectives and educational opportunities, were combined to a variable we named job perspectives (Cronbach's $\alpha = 0.67$) which had a score range of 0 (i.e. all items were denied) to 4 (i.e. all items were confirmed). In 186 cases, these questionnaire results were not saved, because they were fringe benefit items which were considered not important for storage in occupational health data files. Factor analysis (Table 1) showed that job esteem and satisfaction with income loaded on a factor explaining 50% of the variance in occupational rewards, but different from job perspectives which explained 34% of the variance.

Sickness absence was registered in the year following the health check. The number of days and episodes absent were counted for each individual. Partial days off were regarded as full sick days. The frequency of sickness absence was defined as the individual's number of episodes absent in the year following the health check. The mean duration of episodes absent was taken as parameter for absence duration. It was defined according to Hensing et al. [6] as the individual's number of days absent in the year following the health check, divided by the number of episodes absent.

Data were analyzed using SPSS for Windows, version 14. Sickness absence frequency is a form of count data. Therefore, Poisson regression distribution was used to investigate the association of satisfaction with income, job esteem and job perspectives with the frequency of absence. The Poisson distribution has some special features. It is skewed, whereas traditional (i.e. least squares) regression assumes a symmetric distribution. The Poisson regression implicitly uses a log-transformation which adjusts for the skewness, and also prevents the model from producing negative predicted values. Poisson regression analysis models the

Table 1
Principal component analysis of occupational rewards

Reward	Component 1	Component 2
Job esteem	0.87	−0.14
Satisfaction with income	0.86	0.20
Job perspectives	−0.05	0.99
Explained variance	50%	34%

The matrix of principal component analysis of occupational rewards.

variance as a function of the mean, whereas traditional regression assumes a constant variance. In Poisson regression, the dependent variable y has a distribution given the independent variables $x_1, x_2, \ldots, x_i$:

$$P(y = k|x_1, x_2, \ldots x_i) = e^{-\mu}\mu^k/k!$$

$$\text{with} \qquad k = 0, 1, 2, 3, \ldots$$

in which the log of the mean μ is assumed to be a linear function of the independent variables:

$$\log(\mu) = \text{intercept} + b_1 * x_1 + b_2 * x_2 + \ldots. + b_i * x_i$$

The mean duration of episodes absent had a positively skewed distribution with mean 20.9 days (median 7.3 days) and standard deviation 46.2 days (range 1.0 to 365.0 days). Normal distribution was approximated by logarithmic transformation resulting in a mean of 2.3 (median 2.1) and standard deviation of 1.1 (range 0.7 to 5.9). The relationship between satisfaction with income, job esteem and job perspectives on the one hand, and the log-transformed duration on the other was examined using Cox regression analysis.

Results were stratified according to gender, and in both regression models we controlled for age and educational level (1 = none or primary school, 6 = academic). The educational level was recoded into three variables: low (level 1, 2 or 3), medium (level 4) and high (level 5 and 6). In the statistical analysis, low and medium education levels were included as dummy variables relative to high education.

3. Results

The three companies employed 366 workers between them. Thirty-six workers (33 men and 3 women) did not participate in the health checks. Non-participant analysis from our occupational health registration files showed them to be older (mean ± standard deviation of age 45.2 ± 7.5 years) than the participants who were 42.1 ± 9.8 years of age. The mean duration of absence episodes in the follow-up period was 27.1 ± 62.5 days in non-participants and 21.4 ± 46.5 days in participants. The non-participants had 0.9 ± 1.2 episodes of absence and participants were 1.3 ± 1.5 times absent in the follow-up year.

3.1. All participants

None of the participants were registered sick at the beginning of the study. The results of 4 participants whose absence spells continued after the end of follow-up were excluded. Among the remaining 326 workers were 217 men and 109 women. Men had a mean age of 42.6 ± 9.5 years and an educational level of 3.6 ± 1.1, whereas women were 41.0 ± 10.5 years of age and had an educational level of 4.4 ± 1.1. The difference in educational level could be explained from the fact that most (lower educated) crash-barrier production workers were men. The mean frequency of absence was 1.1 ± 1.3 episodes in men and 1.7 ± 1.7 in women. It is known from annual Dutch absence surveys that women have higher sickness absence frequencies than men [1]. The association of sickness absence frequency with the different types of rewards is shown in Table 2. Job esteem was negatively related ($P < 0.01$) to the frequency of absence in men and satisfaction with income was negatively related ($P < 0.01$) to the absence frequency in women.

Age was negatively related ($P < 0.01$) to the frequency of sickness absence in men, whereas psychological job demands were positively associated ($P = 0.02$) with the absence frequency in men. Physical job demands were also positively associated with the number of episodes absent, but at the verge of significance ($P = 0.05$). Neither physical, nor psychological job demands were related with the frequency of absence among women.

Male workers had an absence duration of 17.9 ± 32.7 days, but female workers were longer absent: 25.7 ± 61.7 days. The association between the mean duration of absence episodes and the different types of rewards is shown in Table 3.

The mean absence duration in men with low or medium education was shorter than the mean duration in men with high education. Job demands and rewards were unrelated to the mean duration of episodes absent in both genders.

Table 2
The relation between work characteristics and the frequency of sickness absence

		Men ($n = 217$)		Women ($n = 109$)	
		Rate Ratio	95% CI	Rate Ratio	95% CI
Age		0.98*	0.96–0.99	0.99	0.98–1.01
Educational level[a]	low	1.21	0.69–1.48	1.28	0.69–1.82
	medium	1.20	0.56–1.14	1.21	0.74–1.55
Physical job demands		1.09	1.00–1.18	1.05	0.85–1.30
Psychological job demands		1.12*	1.02–1.24	0.96	0.85–1.08
Job esteem		0.64**	0.47–0.87	1.33	0.86–2.05
Satisfaction with income		1.17	0.87–1.59	0.53**	0.35–0.81
Job support		1.04	0.96–1.12	1.15	1.00–1.32
Job control		0.91	0.76–1.10	1.16	0.86–1.56

[a]relative to high education.
The relation of the frequency of sickness absence with job demands and rewards; presented are the rate ratios and their 95% confidence intervals (95% CI); * $P < 0.05$, ** $P < 0.01$.

Table 3
The relation between work characteristics and the mean duration of episodes absent

		Men ($n = 112$)		Women ($n = 72$)	
		Odds ratio	95% CI	Odds ratio	95% CI
Age		1.01	0.99–1.04	0.98	0.95–1.01
Educational level[a]	low	0.37**	0.19–0.72	0.75	0.35–1.61
	medium	0.47*	0.24–0.88	1.11	0.63–1.93
Physical job demands		0.92	0.80–1.05	1.14	0.82–1.58
Psychological job demands		0.90	0.77–1.06	0.84	0.69–1.02
Job esteem		1.26	0.81–1.95	1.40	0.70–2.81
Satisfaction with income		0.80	0.52–1.23	0.74	0.39–1.40
Job support		1.04	0.93–1.17	1.28	0.98–1.66
Job control		1.11	0.85–1.46	0.97	0.55–1.73

[a]relative to high education.
The relation of the log-transformed duration with job demands and rewards; presented are the odds ratios and their 95% confidence intervals (95% CI); * $P < 0.05$, ** $P < 0.01$.

3.2. Subgroup of participants whose job perspectives were known

The results of the 140 participants (69 men and 71 women), whose perceived job perspectives were known, were studied in more detail (Table 4).

Job perspectives were negatively associated with the frequency of sickness absence in men, but not in women. The other results were in agreement with the findings in the total study population.

4. Discussion

From the Efforts – Rewards Imbalance model point of view, the combination of high efforts and low rewards adversely affects employee well-being [7]. Niedhammer et al. studied efforts and rewards as separate variables in relation to self-reported health, and concluded that low rewards were a significant risk factor for poor health in both genders [21]. Peter and Siegrist reported higher odds of short-term absences and more absence periods in case of status incongruence [23]. In line with these results, we found low rewards in terms of low job esteem to be associated with a higher sickness absence frequency among men. In women, low satisfaction with income was associated with more frequent absence. This gender difference has not been noted before. The absence frequency is thought to be associated with a threshold to take sick-leave. Apart from personality dispositions and organizational policies, this threshold is determined by work engagement and commitment. Highly engaged workers will find it difficult to report themselves sick and stay at work while ill. Alternatively, one could hypothesize that less committed workers have lower sick-leave thresholds and as a result are absent from work more frequently. The results of this study indicate that factors which draw people into their work differ between men and women. Men are likely get involved in work for which they are appreciated. Perhaps it is important for the social status of men to have meaningful work. Interestingly, Nielsen et al. reported a negative association between the meaning of work and the number of short

Table 4
The relation between sickness absence and work characteristics including job perspectives

	Men ($n = 69$)		Women ($n = 71$)	
	Frequency of absence	Mean duration of episodes	Frequency of absence	Mean duration of episodes
Age	0.97 (0.95–1.00)	1.01 (0.97–1.05)	1.00 (0.98–1.02)	0.99 (0.95–1.02)
Educational level[a] low	1.59 (0.73–3.45)	0.53 (0.17–1.67)	0.79 (0.47–1.33)	0.69 (0.28–1.67)
medium	1.28 (0.83–2.18)	0.58 (0.28–1.21)	1.22 (0.60–1.30)	1.24 (0.67–2.32)
Physical job demands	1.12 (0.85–1.47)	0.94 (0.68–1.29)	1.08 (0.84–1.40)	1.11 (0.77–1.60)
Psychological job demands	0.95 (0.81–1.12)	0.71 (0.53–0.94)*	0.92 (0.80–1.05)	0.83 (0.66–1.03)
Job esteem	0.47 (0.46–0.86)**	1.69 (0.56–5.12)	0.99 (0.61–1.60)	1.34 (0.59–3.04)
Satisfaction with income	0.95 (0.56–1.61)	0.59 (0.24–1.44)	0.48 (0.31–0.75)**	0.99 (0.48–2.01)
Job perspectives	0.59 (0.57–0.84)**	1.10 (0.78–1.55)	1.00 (0.81–1.23)	1.20 (0.86–1.67)
Job support	0.89 (0.76–1.04)	0.85 (0.66–1.11)	1.06 (0.91–1.23)	1.33 (1.00–1.77)
Job control	0.84 (0.53–1.33)	1.40 (0.68–2.90)	1.01 (0.70–1.46)	0.95 (0.51–1.79)

[a]relative to high education.

Table 4 The relation of sickness absence with job demands and rewards in the subgroup whose perception of job perspectives was known ($n = 140$); the frequency of sickness absence was analysed with Poisson regression techniques, of which the rate ratios (95% confidence intervals) are shown; the log-transformed mean duration of episodes absent was analysed with Cox regression techniques, of which the odds ratios (95% confidence intervals) are presented; * $P < 0.05$, ** $P < 0.01$.

episodes (1 to 10 days) of sickness absence in men, but not in women [22]. Women seem to get involved in work for which they are being paid well. For women, contributing to the household income might be a more important motivator to work than job status. It is necessary to learn more about work engagement of workers, because our results indicate that men and women are sensitive to different types of occupational rewards.

Although related to the absence frequency, occupational rewards were not related to the mean duration of absence episodes. Peter and Siegrist [23] reported that status incongruence was associated with higher odds (OR = 2.67; 95% CI = 1.24–5.78) of long-term absence. They compared middle managers with short (1 to 3 days) spells, long ($\geqslant$ 4 days) spells, and at least two absence episodes with middle managers without any absence days. Although it is not clear how they included sickness absence in statistical analysis, the results suggest that they counted absence episodes. We used the mean duration of absence episodes as a measure for duration [6], which could explain our different results. Moreover, we assessed job perspectives as a proxy for status control. We did not measure status incongruence as defined by Peter and Siegrist [23].

We investigated the relationship between self-reported job perspectives and sickness absence in a subgroup of our study population. Job perspectives had a different underlying dimension than job esteem and satisfaction with income had. Apparently job perspectives, including stability and advancement, are a different type of occupational reward. We found job perspectives to be negatively related to the frequency of absence in men but not in women. Job perspectives were not associated with the duration of sick leave. Although a different type of reward, job perspectives were related to sickness absence in the same way as job esteem was. One could hypothesize that job stability, promotion perspectives and educational opportunies are also important for the meaning of work.

In this study, we were interested in the contribution of separate reward factors to sickness absence, limiting the comparability of our results to those of Peter and Siegrist [23]. Our study had some other limitations. Self-reported job demands only partly reflect the actual work environment. We chose to study worker's perception of their job demands and rewards because perceptions play a more important role in absenteeism than objective assessment of the work environment [4]. Self-reported questionnaire results, however, may be distorted by response styles, social desirability, and personality dispositions, particularly negative affectivity implying that some people are inclined to complain about everything. Discussion of the results of the Basic Occupational Health Questionnaire during the health check excluded such response styles. Nevertheless, it is important to keep in mind that questionnaire responses may be influenced by subjective feelings.

We studied the results of the questionnaires used in the health checks which were performed by our regional occupational health department in Friesland. Mean age and educational levels of our study population were comparable to the total Dutch workforce, but men were relatively overrepresented constituting 66% of the study population, while 59% of the total Dutch workforce was male in 2005. Besides, our results may suffer from occupational selection bias, as the study on-

ly recruited employees working in large companies in the private sector. The public sector and small traders were not included.

This study showed that occupational rewards in terms of job esteem and satisfaction with income loaded on a common underlying factor that was negatively related to the frequency of sickness absence. Improving job esteem and satisfaction with income could be a promising way to reduce absence frequency, although gender differences should be considered. Low job esteem was associated with more frequent absences in men, whereas dissatisfaction with income was associated with more absence episodes among women. The associations we found warrant more attention for occupational rewards in sickness absence research.

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